
Wireless Phones and Hearing Aids

**Cellular Telecommunications & Internet
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What Is The Goal?

- **Usability - Any consumer who wants to use a wireless phone should be able to use one.**

Reaching the Goal

- **Hearing Aid Compatibility (HAC) and interference are different issues**
- **Requiring internal coupling (HAC) will not solve interference problems**
- **Hearing aid interference is the root problem and is not specific to wireless phones**
- **The wireless industry wants to participate in a solution but the solution cannot rest on the wireless industry alone**

Why HAC Works on Wireline

- Wireline phones use electro-dynamic speakers that are designed to radiate a low-level magnetic field that can be picked up by a T-coil in a hearing aid equipped with a T-coil.
- Wireline phones do not rely on RF energy to transmit calls.
- Hearing aids do not experience interference with wireline phones.

HAC and Interference

- **Hearing Aid Compatibility (HAC) – definition set forth in 47 CFR 68.4(a)(3) and technical specifications set forth in 47 CFR 68.316**
 - **Definition: A telephone is hearing aid compatible if it provides internal means for effective use with hearing aids that are designed to be compatible with telephones which meet established technical standards for hearing aid compatibility.**
- **Interference – has a specific definition, one not related to the definition of HAC**

Hearing Aid Compatibility and Wireless

HAC can:

- Benefit hearing aid wearers who have hearing aids with T-coils and who do not experience interference when using a wireless phone
- Provide inductive coupling only to the 20% of hearing aids that have T-coils
- Be found today in loopsets, other inductive coupling accessory devices and handsets currently on the market – giving T-coil users a choice of multiple compatibility solutions

HAC cannot:

- Fix the problem of interference
- Be retrofitted into phones already on the market

Hearing Aid Compatibility

Difficulties in providing internal coupling in wireless phones:

- **HAC standard is designed for wireline phones; use of this standard for wireless phones will not result in the desired outcome**
- **Manufacturers design and build phones on global platforms that cannot be easily or quickly modified**
- **The addition of components in phones to provide coupling capability will require significant modifications of phones**

Understanding Interference

- **Analog signals do not pose interference problems because they transmit continuous signals**
- **Digital signals, on the other hand, transmit signals as multiple individual pulses of information sent out at different rates depending on technology**
- **Hearing aids pick up the individual pulses of the digital signals and process them as a “noise” or “buzzing” sound**

Interference Mitigation in Hearing Aids

- **Hearing aids can be made more immune so that they will not be as affected by the many RF sources in today's RF rich environment**
- **Increased immunity makes hearing aids resistant to many types of interference including that from digital wireless, security systems and other electronic devices – there is a demand from consumers**
- **Some countries require immunity levels when making purchases through national healthcare systems – there is a market**
- **It is a known solution to interference issues – it works**
- **Modification of hearing aids for relief from interference can be customizable for individual needs**

Industry Challenges

- **Modification of wireless phones to minimize interference to hearing aids affects more than just the handset:**
 - **Implicates basic functionality of wireless phones and could have serious implications for wireless networks and for other consumers**
 - **New Industry Standards for transmit/receive bands**
 - **Requires product development, test, and implementation**
 - **Standards must meet regulations, carrier requirements, market viability, and globalization**

Consumer Options

- **Consumers have choices in the marketplace:**
 - ▣ **Purchase immunized hearing aids**
 - ▣ **Return hearing aids to manufacturers for increased immunity**
- **Selection of Accessory options:**
 - ▣ **T-coil accessory devices:**
 - **Loopsets, Magnetic Coupling**
 - ▣ **Bluetooth accessories:**
 - **being explored for use in phones and hearing aids**

Hearing Aid Solutions

- Increase hearing aid immunity
- Inform consumers of options in the market place
- Label hearing aids with immunity limits
- Inform consumers to support exchange and hearing aid upgrade options
- Customize solutions at Audiologist
 - Hearing aid manufacturers can test hearing aids to wireless fields to judge immunity

International Solutions

- Europe and Australia – worked to resolve interference by increasing immunity in hearing aids
- Australia – “It was confirmed that the interference mechanism is intimately associated with the essential nature of the mobile telephone emissions and is not an incidental by-product which might for example be solved by improved shielding of the telephones.”
 - Interference To Hearing Aids by the Digital Mobile Telephone System, GSM; NAL Report No. 131, May, 1995

Education Efforts

- **Wireless industry is prepared and willing provide education and information to:**
 - **Consumers**
 - **Wireless industry customer care, sales, and marketing personnel**
 - **Hearing aid industry**
 - **Audiologists/hearing specialists**
- **In addition:**
 - **Hearing aid industry should provide education and information to its customers and hearing professionals**
 - **Audiologists/hearing specialists should provide consumers with information on using wireless phones with hearing aids**

Conclusion

- The wireless industry wants to participate in a solution, but the solution cannot rest on the wireless industry alone
- Several important concepts:
 - Interference and hearing aid compatibility are different issues -- hearing aid interference is not specific to wireless phones
 - Imposing interference mitigation on wireless phones would affect the basic functionality of wireless handsets and networks
 - Requiring internal coupling (HAC) will only address 20% of hearing aids (those with T-coils), it will not solve interference problems
 - Unlike TTY, hearing aids are customized – a one size fits all approach to modifying handsets will not work

Conclusion

- **Steps to making digital wireless phones more usable by people with hearing aids:**
 - **Commitment to provide better information and education about options to consumers, wireless industry customer sales and service personnel, audiologists and hearing specialists, and hearing aid industry**
 - **Increased immunity of hearing aids**
 - **Cooperative efforts between the hearing and wireless industries to identify solutions using new technologies such as Bluetooth**